Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Advanced Television Systems	)	
and Their Impact Upon the	)	**MM Docket No. 87-268**
Existing Television Broadcast	)	
Service	)	
	)	
Fifth Further Notice of	)	
Proposed Rule Making	)	

REPLY COMMENTS

OF THE

ADVANCED TELEVISION SYSTEMS COMMITTEE

August 12, 1996

SUMMARY

A careful review of the extensive comments filed in response to the Fifth NPRM shows a broad consensus supporting the Commission's tentative decisions. The great majority of commenters -- including virtually every one of the parties *directly involved* in the provision of broadcast television service -- join ATSC in strongly endorsing the Commission's tentative decision to establish a single, complete, mandatory transmission standard for broadcast DTV, and enthusiastically support the ATSC DTV Standard, based on the Grand Alliance system and recommended by the Advisory Committee, as the best possible choice and far more than fully adequate.

A minority of commenters -- *not directly involved* in broadcast television -- urge the Commission either to adopt only portions of the recommended standard, or not to adopt any standard at all. Some of these parties argue further that if the Commission does adopt a standard, it should not adopt the ATSC DTV Standard recommended by the Advisory Committee. However, these arguments against adopting a standard and the complaints specifically lodged against the ATSC DTV Standard are unfounded, misguided and unconvincing. In some cases they may reflect a desire to minimize any chance that the Commission might attempt to impose a DTV standard on non-broadcast video delivery industries. In other cases they clearly reflect a total lack of concern for the Commission's primary objective in this proceeding -- to upgrade the technical quality of broadcast television in order to help preserve free over-the-air television service in the decades to come.

In particular, the strident objections raised by some members of the computer industry amount to a complaint that the standard was not designed *exclusively* to meet their narrow needs. They claim, erroneously, that the proposed standard does not provide adequate interoperability with computers, yet they stubbornly refuse to recognize the many other interoperability needs that the standard must satisfy (e.g., with cable, DBS, and existing NTSC services), or even the essential needs of the primary broadcast television application.

Moreover, their complaints about a lack of interoperability with computers are entirely unfounded and completely misdirected when aimed at the ATSC DTV Standard -- unquestionably the most computer-friendly digital television system on the planet. Ironically, while their complaints about interoperability risk delaying the introduction of terrestrial broadcast digital television here, far less interoperable digital systems are being adopted and deployed in the U.S. and throughout the world.

In opposing the recommended standard, these members of the computer industry offer cost estimates that purport to show that adopting the ATSC Standard would cost consumers many billions more in the aggregate than a supposedly simpler, less expensive alternative offered by them. But their cost estimates are embarrassingly flawed, combining greatly overestimated unit costs with grossly overstated consumer sales volumes to produce a very high number that has absolutely no basis in reality. In fact, reliable cost estimates prepared by members of ATSC who have extensive experience manufacturing and selling equipment using similar technology, show conclusively that the ATSC DTV Standard will allow consumers to purchase a range of cost-effective DTV receivers and converters, and that at both the low and high ends of this performance range, prices to consumers will be *lower* than they would be under the allegedly less expensive alternative suggested by these members of the computer industry.

The counterproposal they offer is a layered system that would initially only offer "affordable" standard-definition ("SDTV") capability as part of the standard adopted by the Commission, but broadcasters could add additional layers to the bit stream later when HDTV becomes affordable, if there is a demand. They claim this is a far better approach, yet as far as we know, not a single broadcaster in the nation has embraced their proposal. That is because the proposal completely ignores the needs of broadcasters, beginning with two critical requirements.

First, notwithstanding the cornucopia of other valuable services that a digital television system can provide, the principal goal of broadcasters and of the Commission in this endeavor

is to upgrade the technical quality of broadcast television *significantly* so that free over-the-air television service can compete with other means of delivering video in the years and decades ahead. This means that broadcasters must have HDTV capability *guaranteed* in any DTV standard from day one. And HDTV will be eminently affordable to consumers from the beginning of the transition, especially in light of the benefits it delivers.

Second, broadcasters need a complete, proven, tested standard in order to move forward. The industry has spent something over $500 million and most of a decade to satisfy this need. To suggest at this late date that broadcasters or anyone else involved in this historic process accept a last-minute, unproven, unembodied proposal with dubious performance claims is quite simply a non-starter. And to suggest that the process of proposing, evaluating, constructing, testing and selecting from competing systems start all over again, based on these unreliable claims, is just as unthinkable.

Indeed, neither the computer companies' counterproposal, nor anything else in the voluminous comments on the NPRM provides a sound basis for changing the Commission's tentative decision to adopt the ATSC DTV Standard as the single standard for use by digital broadcast television licensees. In fact, a thorough analysis of the comments demonstrates conclusively that the Commission should fully embrace the recommendation of its Advisory Committee and adopt the ATSC DTV Standard in its entirety. By so doing, the Commission will unleash a flurry of investment within the involved industries that will support a rapid implementation of digital broadcast television, quickly bringing the fruits of this beneficial new technology to the American public.

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REPLY COMMENTS OF THE

ADVANCED TELEVISION SYSTEMS COMMITTEE

I. Introduction

The Advanced Television Systems Committee ("ATSC") hereby replies to the comments filed on July 11, 1996 in response to the Commission's Fifth Further Notice of Proposed Rule Making ("NPRM") in its Advanced Television ("ATV") proceeding.

A careful review of the extensive comments filed in response to the NPRM shows a broad consensus supporting the Commission's tentative decisions. The great majority of parties filing comments join ATSC in strongly endorsing the Commission's tentative decision to establish a single, complete, mandatory transmission standard for broadcast DTV, and enthusiastically support the ATSC DTV Standard based on the Grand Alliance system and recommended by the Commission's Advisory Committee on Advanced Television Service ("Advisory Committee") as the best possible choice and far more than fully adequate.

A minority of commenters urges the Commission either to adopt only portions of the recommended standard, or not to adopt any standard at all. Some of these parties argue further that if the Commission does adopt a standard, it should not adopt the ATSC DTV Standard recommended by the Advisory Committee. As demonstrated in the following reply comments, the arguments against adopting a standard and the complaints specifically lodged against the ATSC DTV Standard are misguided and unconvincing. In some cases they may reflect a desire to minimize any chance that the Commission might attempt to impose a DTV standard on non-broadcast video delivery industries. In other cases they clearly reflect a lack of recognition of or concern for the Commission's primary objective in this proceeding -- to upgrade the technical quality of broadcast television in order to help preserve free over-the-air television service in the decades to come. Indeed, these complaints seem to flow from concerns with narrow, non-primary applications of the recommended standard to non-broadcast industries, showing little regard for the essential needs of the primary broadcast television application. Moreover, the alleged inadequacies of the standard for supporting these non-primary applications are technically inaccurate and unfounded, and the cost estimates used to attack the ATSC DTV Standard and to support alternative approaches are obviously flawed, in part, because they don't reflect work that has been done by individual ATSC members to develop cost-reduced consumer receivers and converters. In fact, far more reliable cost estimates prepared by members of ATSC show conclusively that the ATSC DTV Standard will allow consumers to purchase a range of cost-effective DTV receivers and converters, and that at both the low and high ends of this performance range, prices to consumers will be *lower* than they would be under the allegedly less expensive alternative imagined by some members of the computer industry.

In opposing the ATSC Standard recommended by the Advisory Committee, these members of the computer industry, with endorsements from a few other parties, offer a counterproposal which they claim is a far better approach. Yet, as far as we know, not a

single broadcaster in the nation has embraced this proposal. That is because the proposal completely ignores the needs of broadcasters, beginning with two critical requirements.

Notwithstanding all of the other valuable services that a digital television system can provide, the principal goal of broadcasters and of the Commission in this endeavor is to upgrade the technical quality of their service *significantly* so that free over-the-air television service can compete with other means of delivering video in the years and decades ahead. This means that broadcasters must have HDTV capability *guaranteed* in any DTV standard from day one.

Furthermore, broadcasters need a complete, proven, tested standard in order to move forward. The industry has spent something over $500 million and most of a decade to satisfy this need. To suggest at this late date that broadcasters or anyone else involved in this historic process accept a last-minute, unproven, unembodied proposal with dubious performance claims is quite simply a non-starter.

Indeed, neither the computer companies' counterproposal, nor anything else in the voluminous comments on the NPRM provides a sound basis for changing the Commission's tentative decision to adopt the ATSC DTV Standard as the single standard for use by digital broadcast television licensees. In fact, a thorough analysis of the comments demonstrates conclusively that the Commission should fully embrace the recommendation of its Advisory Committee and adopt the ATSC DTV Standard in its entirety. By so doing, the Commission will unleash a flurry of investment within the involved industries that will support a rapid implementation of digital broadcast television, quickly bringing the fruits of this beneficial new technology to the American public.

II. The Commission's Proposal to Mandate Use of the Full ATSC DTV Standard Is Essential

A. The Commission Should Mandate a Standard

In our initial comments, we explained that a standard is required in order to provide the certainty and reliability necessary for broadcasters, manufacturers and consumers to invest in digital television, that a clear, unambiguous standard is necessary to provide a reliable basis for the design of broadcast and consumer equipment, and that an FCC requirement *mandating* the use of the DTV standard by digital broadcast licensees is necessary to achieve these goals.

The great majority of commenters strongly supported a mandated standard, stressing the need for clarity, confidence and certainty by investors, broadcasters, manufacturers and consumers in order to engender a rapid transition to digital television. For example, the U.S. Department of Commerce and National Telecommunications and Information Administration ("NTIA") at 1, explains that:

> "Digital television promises American consumers a greatly improved and very flexible television service, one that will include the ability to receive a range of new and exciting services. Digital television also promises myriad benefits for the U.S. economy. These benefits will accrue, however, only if the Commission acts rapidly to adopt a digital television transmission standard so that the transition to digital television can begin promptly
>
> Commission adoption of a transmission standard will provide certainty to consumers, broadcast licensees, and equipment manufacturers, which in turn will help alleviate the "chicken and egg" problem inherent in adoption of any totally new system. The knowledge that equipment will not soon be rendered obsolete will encourage rapid investment in the new system, investment that is needed to facilitate the transition to digital. Adoption of a transmission standard also will eliminate the need to purchase duplicative equipment or numerous conversion devices, thus keeping consumer, broadcaster, and manufacturer costs down. One need only look to America's experience with AM stereo to realize that the acceptance and likelihood of success of new broadcast technologies are greatly enhanced when a standard is adopted."[1]

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[1]Many other parties, as well, urge the Commission not to repeat the stereo AM debacle by failing to set a single standard. *See* Comments of the Executive Office of the President, Office of Science and Technology Policy at 2; Comments of 91 Broadcast Organizations at *ii*, 19; Digital HDTV Grand Alliance ("Grand Alliance") Comments at *ii*, 12; Thomson Consumer Electronics Comments at 7, fn. 1; Philips Electronics

Similarly, 91 broadcasters and broadcast organizations describe in convincing detail why a standard is essential, saying "The wide array of players critical to the success of DTV will not participate in the transition to DTV unless they are confident that there is a real opportunity for a *comprehensive* transition Establishing a standard is the most important step to be taken toward securing the confidence of *producers* , *equipment manufacturers* , *investors and financial institutions* , *broadcasters* , and *consumers* " (Broadcasters' Comments at *i*, *ii*, 1-2, 15-20, emphasis in original.) The National Consumers League (at 1) also urges the Commission to adopt the proposed transmission standard for HDTV, saying "[w]e agree that manufacturers of digital receivers and broadcasters need certainty before they will make the required investments for HDTV Consumers also need certainty more than anyone else, for it will be consumers who will drive the marketplace." Numerous other parties also offer compelling arguments urging the Commission to adopt a single standard.[2]

Several parties stress the positive impacts on jobs and economic development that will flow from a Commission decision to adopt a standard For example, OSTP (at 3) states "There is a well known maxim of the international technology [marketplace:] international

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Comments at *iv*, 6, 8; Matsushita Electric Corporation of America Comments at 4; Sony Electronics Comments at 1; and Comments of Hammett & Edison at 4. The Computer Industry Coalition on Advanced Television Service ("CICATS") claims that not mandating a standard would not repeat the AM Stereo problem, because in this case there is motivation to establish a voluntary standard, since once NTSC transmissions cease, consumers will be forced to upgrade in order to receive TV. This logic of this claim is circular and unavailing. The Commission certainly would not order NTSC transmissions to cease if the transition to DTV had not been successful because of confusion and uncertainty caused by the lack of a standard.

[2]*See* Grand Alliance Comments at *i*, 2, 6; Comments of the Electronic Industries Association and EIA Advanced Television Committee ("EIA/ATV") at *ii*, 7; Comments of the Advanced Television Technology Center ("ATTC") at 2-3; Comments of Thomson Consumer Electronics at 1, 4; Comments of Zenith Electronics at 2-5; Comments of General Instrument at 2-3; Comments of Philips Electronics North America at *iv*, 1, 3-6; Comments of Dolby Laboratories at 3. Comments of Tektronix at 2, Comments of Sony Electronics at 1, 7, 8, 11; Comments of Hitachi America at 2-4; Comments of Mitsubishi Consumer Electronics America ("MCEA") at *i*, 2; Comments of Matsushita Electric Corporation of America ("MECA") at 2, 6; Comments of Advanced Broadcasting Systems of Canada ("ABSOC") at 2; Comments of Citizens for HDTV at 4, 12; Comments of the Department for Professional Employees, AFL/CIO at 1; Comments of the Association of Federal Communications Consulting Engineers ("AFCCE") at 2; Comments of Hammett & Edison ("H&E") at 1; Comments of Cohen, Dippell and Everist ("CD&E") at 4, 5; Comments of Circuit City at 3, 5; Comments of Jae Lim at 1; and Comments of John Carroll at 1 4.

capital and R&D investment, technical and creative talent, new manufacturing, plant siting, and resulting job growth all flow to the country that grabs the early technological lead," and NTIA (at 1) notes that "[a]doption of a digital transmission standard promises to spur the American economy in terms of manufacturing, trade, technological development, and international investment -- including job growth " Philips (at 2), Thomson (at 2) and Citizens for HDTV (at 5, 8, 16-17) echo these views

Several parties who generally support the specific ATSC DTV Standard, but with one or more caveats, also endorse the need for a mandated standard. For example, the Information Technology Industry Council ("ITI") a leading computer industry trade association, (at 2) supports a mandated standard, but objects to any inclusion of interlaced formats. And although he objects to some aspects of the recommended standard, William Schreiber (Vol. II at 1) says that a mandated standard is absolutely essential at the outset of the service in order to provide certainty [3]

In contrast to this prevalent view endorsing a mandated standard, the National Cable Television Association ("NCTA") (at 1), a founding member of ATSC, joined by Tele-Communications, Inc. ("TCI") (at 1), says it would be an irreversible mistake for the government to adopt a federal technology standard for digital TV, noting "well-established drawbacks" of freezing technology and innovation, and reducing competition and consumer choice. Stressing that its comments should not be read to be critical of the particular DTV standard recommended by the Advisory Committee, NCTA (at 3-5) acknowledges the substantial investment of sweat and capital equity by many, including many in the cable industry, but states that even when advised by industry representatives, the government should not substitute its judgment for that of the marketplace. NCTA argues that a thriving market is developing in cable and DBS without any government standard, and NCTA and TCI both

[3]Universal Studios (at 2), Polaroid (at 2), and TelQuest Systems (at 2-3, 6)

note the error that would have been made if an analog HDTV standard had been rushed through before all-digital capability was proven.[4]

The non-cable members of ATSC wonder if this somewhat surprising opposition by the cable industry to FCC adoption of a *terrestrial broadcast* standard may not flow from the concerns of the cable industry that the Commission might impose the same DTV standard on the cable industry, as indeed some parties to this proceeding have proposed. This is unfortunate, because as we explained in our initial comments (at 27-28), we believe that as *voluntary* standards activities continue in the cable industry and with other video delivery systems, it is likely that many elements of the terrestrial ATV standard will also be incorporated in emerging standards in these industries. We believe that such *voluntary* standards will promote the early availability of digital television, including HDTV, over all of these other media as well as terrestrial broadcasts, without causing undue burdens on cable operators or other providers. Indeed, the ability of these other competitive delivery media to introduce compelling new technologies without FCC review and approval will continue to provide pressure to ensure that universal broadcast television service implements the technology required to remain responsive to consumer needs

Recognizing that the cable industry has concerns over the impact on its business of mandating a terrestrial broadcast transmission standard, nevertheless, we don't believe their arguments negate the compelling need for the Commission to establish a *terrestrial broadcast* transmission standard. First, the Commission is not being asked to substitute its judgment for that of the marketplace, but rather to endorse and adopt a broad industry consensus that will allow all parties to move forward confidently and productively in the rapid implementation of

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[4]The recent dramatic success of DBS illustrates the strong consumer demand for the improved technical quality and greater program choices available through digital television technology, however, in considering the different case of universal, free over-the-air broadcast television, the DBS experience highlights the need for a single standard. Presently, each competing DBS service utilizes different receiving equipment, incompatible even for the same intended use. If consumers wish to change DBS providers, they must scrap their investment and purchase new receiving equipment. This model may be effective for a subscription, premium service like DBS, but we believe it would be not be acceptable for universal free over-the-air television.

digital broadcast television. Indeed, the cable industry has contributed mightily to developing, evaluating and testing that consensus, and does not oppose the specific ATSC DTV Standard for terrestrial broadcast transmission. Second, we do not believe that adopting the ATSC DTV Standard will freeze technology and innovation, or reduce competition and customer choice. As we explained in our initial comments, the ATSC DTV Standard based on the Grand Alliance system offers unprecedented flexibility to accommodate new applications and uses, and unmatched headroom for growth to include new technological improvements. Third, rapidly adopting a broadcast DTV standard now would not be like rushing to adopt analog HDTV before the advent of all-digital capability. Digital television systems are rapidly being deployed here in the U.S. and throughout the world. And we believe that we have the world's best terrestrial broadcast television technology firmly in hand, with proven, thoroughly tested performance and tremendous flexibility and headroom for growth. For the Commission to delay or withdraw now would be a grave mistake, we believe, and would mean turning away from its obligation to help preserve free over-the-air television in the years and decades to come.

Comments by the members of the computer industry are mixed regarding the advisability of setting a standard. ITI (at 1) urges the Commission promptly to adopt and implement a standard, along with policies to stimulate the development of National Information Infrastructure ("NII") applications, although it favors the exclusive use of progressive scan transmission formats.

In sharp contrast, several other computer industry commenters strongly urge the Commission not to mandate a DTV transmission standard. Microsoft (1-2) says imposing the ATSC DTV Standard would be a public policy disaster, and that the marketplace, not government, is the best avenue for development of a DTV standard. The Business Software Alliance ("BSA") (at 1-2, 6) echoes these sentiments, but says that it has no objection to standards adopted through industry consensus.

The Computer Industry Coalition on Advanced Television Service ("CICATS") (at *i*, 1-2)[5] urges the Commission not to adopt a DTV standard, especially not the ATSC DTV Standard, favoring voluntary standards instead. However, if the Commission does adopt a standard, it should adopt the minimum standard necessary to protect spectrum users from interference, and if more is adopted, the Commission should adopt no more than the CICATS "refinement" of the Advisory Committee recommendation, i.e., a single baseline standard-definition (SDTV) format, leaving any further enhancements to the marketplace. CICATS (at 10) says the U.S. should not rush in to set a standard because technology is changing so rapidly.

Compaq (at *i-ii*, 1-2) also urges the FCC to reject the ATSC DTV Standard, saying any mandated standard would disserve the public interest, by stifling innovation and inhibiting competition, but if the Commission insists on adopting a standard, it should adopt the CICATS proposal. Compaq (at 6, 10) argues that voluntary industry standards can provide sufficient certainty, and that all parties have incentives for adopting a voluntary standard, because broadcast television is an established service.

Although some of these computer companies fill page after page describing dire consequences of government-imposed standards, their arguments miss the mark and are entirely unconvincing. The Commission is *not* being asked to substitute its judgment for that of the marketplace, but to endorse and adopt an extremely broad consensus joined in by virtually all of the participants who have a direct stake in upgrading the technical quality of terrestrial broadcast television. This is precisely the type of industry consensus to which BSA states it has no objection.

Furthermore, every participant in this decade-long historic process would be dismayed to hear the final stage of this effort characterized as "rushing in to set a standard." After an incredibly deliberate and careful process, evaluating competing proposals and then

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[5]CICATS has fewer members than it did when it filed comments on the Fourth NPRM in this docket. CICATS now includes Apple, Compaq, Dell, Intel and Microsoft.

incorporating the best attributes of each, refining and improving digital video compression technology over the past six years, and building and exhaustively testing actual prototype equipment, we have in hand the world's best digital television technology, with unmatched flexibility for additional applications and headroom for growth. While less capable digital TV systems are spreading throughout the world, it would be foolish for broadcasters to turn away from the best, proven technology because something better will come in the future. All that is needed now is for the Commission to follow through on its commitment to set a standard, so that investors, broadcasters, manufacturers and consumers can all move forward together with certainty that their investments will be mutually beneficial

OSTP (at 2) sums up the issue succinctly

> "We recognize that some argue that the adoption of a single digital television standard would freeze the current state of technology. That is simply wrong. The ATSC DTV standard is sufficiently flexible that it can accommodate new developments in either interlace or progressive scan display formats. The FCC process always is open to review new alternative standards. In point of fact, a technological freeze will be occasioned only upon the *failure* to adopt a standard. The lesson of AM stereo should be clear to all of us: failure to adopt broadcast standards leads to failure to develop new broadcast services. American consumers and workers suffer." (emphasis in original)

Although some members of the computer industry stress their opposition to government-imposed standards and their strong preference for voluntary standards instead, their strident opposition to the Advisory Committee's recommendation -- an extremely broad industry consensus developed through an unprecedented, deliberate and totally open process -- strongly suggests that it is the Advisory Committee's recommendation itself that they oppose, and that their opposition to an FCC-mandated standard for broadcast television is only a means to force modifications to the proposed standard or to thwart its rapid adoption entirely. Indeed, the very architect of the CICATS counterproposal to the Advisory Committee recommendation urges the Commission *not* to let the market decide, because that would mean getting the Advisory Committee standard, but rather the Commission should adopt a standard,

but should not adopt the Advisory Committee proposal nor allow it. (Comments of DemoGraFX ("Demos") at 3.)

The Coalition of Film Makers (at *i*, 3), although misinformed and consequently misguided, we believe, in its opposition to the proposed standard, is straightforward, saying it's imperative for the FCC to adopt a standard, because failing to do so would result in a *de facto* standard developed by "foreign manufacturers" prepared to capture the U.S. market.[6]

Many parties note the special nature of free over-the-air broadcasting which makes it essential that the Commission adopt a standard.[7] General Instrument (at 4) argues that the general issue of the proper role of the FCC in setting standards should be examined in a separate proceeding, but that the universal broadcast system is not the place for application of a new policy. MECA (at 5-6) says it's legitimate and proper for broadcasters to request the FCC to facilitate this transition, and argues that failure to act would likely bring no standard or a less inclusive *de facto* standard. Hitachi America (at 3, 5, 6) points out that failure to adopt a standard will sacrifice the U.S.'s hard-won leadership position, and that concerns re stifling innovation and limiting competition and fears that rapid advances will soon render the standard obsolete are unwarranted. The Grand Alliance (at *ii*, 10-11) and Dolby (at 3) also extol the flexibility and extensibility of the standard, stating that concerns regarding obsolescence of the standard are greatly exaggerated. And EIA/ATV (at *ii*, 5) and ATTC (at 4-6) stress the value of a mandated transmission standard to spur price and features competition that will build sales volumes and lower prices to consumers.

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[6]This reference, unfortunately, is but one of several in the comments where detractors of the proposed standard have attempted to recruit support by mischaracterizing and discrediting the work of the Advisory Committee, calling it some kind of plot by foreign manufacturers. *See, e.g.*, Comments of the American Homeowners Foundation at 1-2. First, it is the Advisory Committee and especially broadcasters who have dictated the specifications for the standard, including requiring substantial modifications to the original Grand Alliance proposal. Furthermore, most, if not all, of the manufacturers active in the Advisory Committee process, including those owned by foreign corporations, maintain extensive R&D and manufacturing facilities in the U.S., collectively employing many tens of thousands of American workers in their operations.

[7]*See, e.g.*, Broadcasters Comments at 15-20, Thomson Comments at 5, Zenith Comments at 4, General Instrument Comments at 3, Philips Comments at 4-5, MECA Comments at 6, EIA/ATV Comments at 6, ATSC Comments at 7, ATTC Comments at 2, Citizens for HDTV Comments at 6, Benton Foundation Comments at 4, and Consumer Federation of America/Media Access Project ("CFA/MAP") Comments at 2.

TCI (at 2, 6-8) and NCTA (Owen Appendix at 14) argue that if the Advisory Committee is correct in claiming there is no superior alternative, then the market will adopt the proposed ATV standard without any FCC mandate. We believe this argument misses the point. While there is a strong consensus supporting the proposed standard among the most directly affected parties, adoption of a single standard by the Commission is still necessary to give the confidence and certainty to the many different groups who need to make timely, mutually reinforcing investment decisions. And at this point, after years of anticipation, any step away from the expected Commission endorsement of its Advisory Committee's recommendation would send a strong negative signal that would heighten concerns and uncertainty and paralyze investment, jeopardizing a swift transition to digital television and the rapid recovery of valuable television spectrum. Indeed, positive Commission action is needed now more than ever to dispel uncertainty and avoid delay, in light of the strong (though unfounded) objections by some members of the computer industry.[8]

Indeed several parties stress the importance of the Commission living up to the covenant it made with industry to adopt a standard. For example, William Schreiber (Vol. II at 2) states "[a]fter all this time and effort, a statement by the Commission that no new standard is needed would be greeted with dismay. It would make it very difficult to carry out a similar process in the future. In effect, the Commission has asked the industry to develop a new standard, and the industry has complied. The Commission should therefore issue a new standard," (but should scrutinize the proposal with great care). General Instrument (at 2, 5) similarly urges the Commission to act, saying "[i]ndustry has committed vast financial and manpower resources in the valid expectation that the Commission would adopt a standard for advanced television. Industry shouldered the burden of minimizing technical uncertainty with

[8]The Broadcasters (at 20), Thomson (at 5), Hitachi America (at 4), and the Grand Alliance (at 8) all agree, arguing convincingly that the existing broad consensus doesn't negate the need for a mandatory standard.

the expectation that the Commission would shoulder the burden of minimizing marketplace uncertainty."[9]

The weight of all of these comments demonstrates convincingly that the Commission should finalize its tentative decision to mandate a single DTV transmission standard as rapidly as possible.

B. The Full ATSC DTV Standard Should be Adopted

The majority of commenters agree with the ATSC that the Commission should adopt the proposed standard in its entirety, rejecting the idea of adopting only some layers of the standard. However, some parties urge the Commission to adopt only certain parts of the standard, if it adopts anything at all.

Michael Bove, *et al* (at 1) advise the Commission to specify a modulation standard and a bitstream layer transmission standard only. Intel (at 8) says the Commission should require an RF/transmission layer once its ability to transmit executable code is confirmed, leaving the market to determine the most efficient coding and compression technologies. Microsoft (at 3) argues that if the Commission adopts a standard at all, it should do so only to the extent necessary to prevent interference, or it should adopt a modified version. Microsoft (Mundie statement at 7) also states that it would not object to a standard that included a modulation technique and a low-level bitstream format absent a specified video format.[10] The Benton Foundation (at 3) urges the Commission to adopt no more than the minimal rules needed to protect spectrum users from interference, but that if the Commission must adopt more, it should adopt SDTV which allows multiple programs, and not HDTV.

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[9]MECA (at 13) urges the Commission to "continue to act in good faith, as it always has, with industry by moving rapidly forward and adopting the full ATSC ATV standard." The Broadcasters (at 21), Zenith (at 17), Thomson (at 17), the Grand Alliance (at *iv*, 33), and Sony (at 9) also make similar comments urging the Commission to honor its covenant with the industry to adopt a DTV standard.

[10]Although CICATS objects mightily to the video formats of the standard, it states (at 14) that only these video formats would create material technological difficulties for the computer and software industries, and that if the Commission adopts a DTV broadcast standard, CICATS would not oppose adoption of the video coding, audio coding, packetized data transport, or RF/transmission components of the proposed standard.

The Broadcasters (at *ii*, 2, 23) oppose partial adoption, saying there is no risk inherent in adopting the entire standard because of its flexibility and headroom for improvement. They say that no potential innovation has been identified that the proposed standard cannot accommodate. Tektronix (at 3) says adopting the entire standard doesn't limit broadcasters, because additional standards such as data delivery can be used in place of or in addition to the video layer. MECA (at 2-3) stresses that the recommended standard is a total system, not a menu of subsystems, and that to change a piece would alter the balance of the carefully crafted whole. MECA (at 3) also notes the early Advisory Committee decision to evaluate and test *complete* working HDTV proposals, not partial or paper proposals. The Grand Alliance (at *i*, *ii*, 9, 13) explains how all layers of the proposed standard are required for the Commission to achieve all of its goals. And Sony (at 13) echoes a point we made in our initial comments that a full standard is required in order for the Commission to satisfy its statutory obligations to ensure that closed captioning and program rating (V-chip) services can be provided.[11]

During the course of the lengthy Advisory Committee process, all of these issues were examined in determining exactly what should be included in the standard to be adopted and what should be left open for the marketplace to determine. As we explained in our initial comments, adopting only some of the layers of the proposed standard would create delay and uncertainty that would chill investment and postpone, if not jeopardize entirely the transition to digital television. Moreover, the video formats layer of the standard was one of the most thoroughly examined aspects of the standard and was central in the Advisory Committee's successful effort to forge a broad industry consensus. To leave that layer out of the standard would be tantamount to not adopting a standard at all. MECA and MCEA's views are persuasive: without all of the layers, and particularly without the video formats layer, there is

[11]CD&E (at 4-5), Thomson (at 1, 6, 7), Zenith (at 2, 3, 5, 7), MCEA (at 2), Hitachi America (at 6), Sony (at 2, 12), EIA/ATV (at *ii*, 2, 14), ATTC (at 6, fn. 4), and Citizens for HDTV (at 4, 12) also argue persuasively that the full standard should be adopted by the Commission

no consensus and no reliable basis for moving forward. Accordingly, the Commission should act rapidly to *adopt all layers* of the ATSC DTV Standard.

III. The ATSC DTV Standard Represents the World's Best Digital Television Technology and Is Far More Than Adequate

In the NPRM, the Commission sought comments on its tentative decision to adopt the ATSC DTV Standard recommended by its Advisory Committee, specifically asking whether the proposed standard is adequate to meet the Commission's objectives. In response, virtually all of the broadcasters, manufacturers and broadcast engineers directly involved in the broadcast television business, as well as many other parties, praise the proposed standard, while several commenters in the computer industry and some commenters in the motion picture industry register a variety of objections to the proposal, and several MIT researchers offer their opinions regarding radically different approaches to the provision of digital broadcast services, usually with no particular focus on television service.

A theme of these divergent views is strikingly apparent from the comments: the parties opposing the ATSC DTV Standard consistently show little or no interest in the future of free over-the-air television, rarely if ever mentioning broadcasters and the challenges they face in making a successful transition to digital television. Instead, these parties focus *exclusively* on whether the standard is ideally suited to *their* narrow purposes, with little or no regard for the needs of other industries.

Some of these parties do include estimates of the costs of receivers and converters for consumers, but these estimates are based on demonstrably false assumptions about equipment costs and performance issues, and as a result are completely erroneous. Several members of the computer industry, along with a few other parties who have accepted these erroneous estimates at face value, mount strenuous objections based on them, while ignoring the consensus solutions developed through solid scientific methods within MPEG, ATSC, the Advisory Committee, and the International Telecommunication Union ("ITU") over the past

several years. As these reply comments, and no doubt others, will show, the objections to the ATSC DTV Standard are unsound, and the ATSC DTV Standard is indeed far more than fully adequate for its intended purposes, and should be adopted posthaste.

The Broadcasters (at *ii*, 3, 6) say the standard is universally acknowledged as exceptional, providing a wide range of functions today that can be extended to provide innovations in the future, and that its technical virtuosity maximizes spectral efficiency, interoperability and growth. They emphasize (at 9) that supporting multiple formats greatly expands the value of DTV to consumers while adding very little to the price of consumer equipment.[12] Canadian broadcasters who have also been heavily involved in the Advisory Committee and ATSC processes reinforce this view, noting that the standard meets key requirements, including flexibility and extensibility (ABSOC at 9)[13]

MECA (at 4) and Hitachi America (at 2-3) tout the proposed standard as representing the best digital video technology in the world, stressing its capabilites for flexible evolution. EIA/ATV (at 8, 9, 15) argues that any notion that the standard might discourage innovation or impede competition is plainly mistaken, that it eliminates the threat of technological anarchy by providing a baseline for innovation, and that EIA/ATV is unaware of any service that the ATSC DTV Standard could not provide. H&E (at 1) finds the standard entirely adequate, with ample flexibility to accommodate future technological improvements. AFCCE supports the standard, noting its flexibility and interoperability features which ought to satisfy even those from non-TV industries who clamor for an inflexible standard based on a single scanning mode.

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[12]The broadcast community knows this, because they initiated and participated in Advisory Committee working groups focused specifically on this concern. Those parties who stridently claim otherwise are simply misinformed and mistaken, as these comments will demonstrate.

[13]*See also,* Reply Comments of the North American National Broadcasters Association, August 9, 1996, saying the Grand Alliance system has had significant review by American, Canadian and Mexican broadcasters and represents world leading technology, formally urging adoption of the ATSC DTV standard for all of North America.

The Grand Alliance (at *i*, 2-3) calls the standard the best possible, more than fully adequate, with unmatched flexibility and unprecedented ability to incorporate future improvements, able to support a wide variety of information services in addition to news, sports, education and entertainment television. The Grand Alliance (at 10, 14) also believes that the standard offers the world's best digital television technology, and that concerns regarding obsolescence are greatly exaggerated. Philips (at 9) calls the standard a towering technological achievement. Thomson (at 2, 8) and Zenith (at 3, 7) also extol the virtues of the standard, noting its flexibility and headroom for growth, and arguing that adopting and implementing it will preserve free over-the-air TV, enable a host of NII applications, permit a more efficient refarming of television spectrum, and preserve and create jobs and engender economic growth.

A. Computer Industry Complaints about the ATSC DTV Standard Are Unfounded

In sharp contrast to the nearly universal support for the proposed standard among broadcasters and the parties who have the most direct interest in broadcast television and who have labored for almost a decade in the Advisory Committee and ATSC processes, some members of the computer industry, led by CICATS, mount an all-out assault on the ATSC DTV Standard, making almost any claim, no matter how distorted, that might discredit the standard and the historic process that led to its creation. The Commission, as the creator and leader of the Advisory Committee process, with its staff carefully monitoring the work over the years, will itself recognize some of the baseless accusations as readily as any of the participants. Nevertheless, these reply comments and undoubtedly the reply comments of other participants in the Advisory Committee process will show conclusively that these complaints are unfounded and that the Commission can proceed swiftly and confidently to adopt the proposed standard.

CICATS (at 5) claims that the Advisory Committee recommendation would stifle innovation, and hurt the national economy and the competitiveness of U.S. firms nationwide.

Saying that government-mandated standards are often the product of political compromise and interest group politics, rather than thorough and unbiased analysis, CICATS (at 7) calls the Advisory Committee process a textbook example of this phenomenon, producing a proposed standard that is flatly inconsistent with the convergence of computers and televisions.

This claim is demonstrably false, and an insult to the hundreds of industry volunteers who labored mightily in dozens of industry specialist groups to specify requirements for a DTV system and then exhaustively and thoroughly evaluated and tested competing proposals. The constant goal of each of these groups and the only basis for including or excluding aspects of the standard was the technical merit of a proposal, i.e., the extent to which it would satisfy clearly defined criteria designed to provide the best possible advanced broadcast television service, including easy interoperability with other media, including computers and telecommunications. And while "convergence of computers and televisions" was not an explicit goal of the effort, nor should it have been, no less than three of the clearly defined objectives for the standard were directly focused on ensuring the greatest possible compatibility and interoperability with computers and telecommunications, and the proposed ATSC DTV Standard undeniably offers *unmatched interoperability* as compared to any other digital television system on the planet.

CICATS' real complaint is that the Advisory Committee did not develop a standard designed exclusively for computers. However, the principal goal of the Advisory Committee was to develop a standard that would bring quantum improvements to terrestrial broadcast television service in a manner that consumers would find attractive, including the ability to provide a host of innovative information services beyond traditional television services. The proposed standard was carefully designed to be *inclusive* in order to meet the needs of many constituencies, including the computer industry. As we described in detail in our initial comments (at 17-19), the proposed standard benefited greatly from the substantial efforts of a number of members of the computer industry to ensure that their needs were met. To

characterize the efforts of the Advisory Committee to be inclusive of the needs of different industries as "political compromise and interest group politics" is a gross and intentionally misleading distortion. The broad industry consensus in support of the proposed standard speaks volumes about the integrity of the process as reflected by the adoption of the Advisory Committee's final report *without a single negative vote*, even from members of the computer industry.[14]

CICATS (at *iii*, 5, 28) and some of its members find great fault with the Advisory Committee proposal, including interoperability issues that we will address in later sections of these comments, but one of the fundamental flaws, they claim, is that the proposed standard unnecessarily boosts broadcaster and consumer costs by forcing them to leap beyond SDTV to more expensive HDTV, denying consumers any role in choosing. They claim the aggregate cost to consumers over a seven-year period would be $91 billion, whereas implementing a CICATS counterproposal to implement SDTV would only cost $44 billion, saving consumers almost $50 billion.

Although we do not include an analysis of the CICATS cost figures here, we are aware of several analyses that individual members of ATSC plan to submit as part of their individual reply comments. These analyses show convincingly that CICATS bases its unit cost figures on completely erroneous assumptions and then uses other totally unrealistic volume sales assumptions to create large aggregate numbers that it expects will impress the Commission. But quite apart from their erroneous cost estimates, they are comparing apples and oranges -- their cost of providing SDTV to the ATSC Standard's cost of delivering HDTV and SDTV. Consumers could save billions by buying bicycles instead of automobiles, but that hardly argues for adopting an automobile standard that features two wheels and a foot-powered chain-drive mechanism. More important, CICATS' cavalier treatment of

[14]CICATS (at 1, fn. 1) is mistaken in saying that both Advisory Committee members representing the computer industry abstained in the vote. The representative of Digital Equipment Corporation cast an affirmative vote.

HDTV gets to the heart of the matter and clearly identifies two key fallacies that underlie their complaints about the standard.

If the Commission adopts a standard, CICATS (at 32-33) counterproposes a "mere refinement" to the Advisory Committee standard. They propose a single 480-line progressive scan baseline format, with unspecified aspect ratios and temporal layering for variable frame rates, and a layering technique they claim would allow broadcasters to provide resolutions comparable in quality to the highest resolution formats in the Advisory Committee standard. Under their proposal, only the baseline format would be part of the standard, but they indicate that individual broadcasters could layer additional video data to add HDTV into the bit stream if demand existed.

In this comment the first key fallacy of the CICATS counterproposal is starkly revealed. Broadcasters must make an assessment of what their viewers will demand and what level of quality they must provide in order to remain competitive with other video delivery media, and they must make that assessment before adopting a standard and before implementing DTV. Indeed, Broadcasters made that assessment years ago, and demanded that top-quality HDTV be provided on day one by any system proposed as the basis for a new standard. Moreover, the Commission long ago made a clear decision to incorporate full HDTV in the standard it would adopt unless that proved technically impossible. Broadcasters have made clear, particularly in the last nine months, that HDTV is and should be the centerpiece application of their DTV service. HDTV is what consumers want and what broadcasters must provide in order to remain competitive in the future.[15,16] It is characteristic

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[15]Unlike broadcasters and consumer electronics manufacturers, CICATS has completely overlooked the viewing public's desire for higher quality.

[16]CICATS, quoting every negative statement William Schreiber ever made about the proposed standard, evidently overlooked his view (Vol. I at 7) that it is vital to include HDTV from day one, in order to motivate consumers to make the transition to digital television. CICATS also ignores the admonition of the Clinton Administration's Information Infrastructure Task Force flowing out of the 1994 government/industry Advanced Digital Video Workshop, saying that the Advisory Committee/Grand Alliance proposal for HDTV is the best available alternative -- "superior to . . . incrementally deploying a system that involves digitizing today's television signals, but not changing the fundamental picture formats and other technical parameters of the current broadcasting infrastructure." CICATS also ignores the benefits of deploying high-resolution